REMARKS

Re-examination and allowance of the present application is respectfully requested.

Applicants thank the Examiner for indicating that the filed drawings are acceptable, and for acknowledging the claim for foreign priority and receipt of the certified copies of the priority documents.

The Examiner indicated that the specification has not been checked to determine the presence of possible minor errors, and requests Applicants' cooperation in correcting any error of which they become aware of. Applicants are not aware of any errors in the specification requiring correction. Should Applicants become aware of any errors requiring correction, or the Examiner notes the presence of any errors requiring correction, Applicants will make corrections. Accordingly, the Examiner is respectfully requested to withdraw the objection to the specification.

By the current amendment, Applicants submit a Substitute Abstract that is drafted to more clearly define the present invention. Entry of the Substitute Abstract is respectfully requested.

Claim 11 stands objected to as containing an informality. By the current amendment, claim 11 is canceled. Accordingly, Applicants submit that the ground for the objection to claim 11 no longer exists, and respectfully requests withdrawal of this ground of objection. However, said cancellation is not to be taken as an acquiescence of the appropriateness of the objection, but as a desire to advance the prosecution of this application.

The Examiner rejects claims 4, 6 and 11 under 35 U.S.C. §112, second paragraph, asserting the claims are indefinite. By the current amendment, Applicants amend claims 4 and 6, paying particular attention to the concerns raised by the Examiner, and cancel, without prejudice, claim 11. In view of the present amendment, Applicants submit that the grounds for the 35 U.S.C. §112, second paragraph rejection no longer exists, and respectfully request its withdrawal.

Claims 1-5, 9, 11 and 12 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,675,648 to TOWNSEND. Applicants respectfully traverse this ground of rejection.

According to a feature of the present invention, first data is generated using a first propagation estimation value, and a signal is encoded using a second propagation estimation value that is estimated by a communicating party using a reference signal decoded to obtain second data using the first data. Applicants submit that the present invention, as defined by the claims, is not taught or suggested by the prior art combination suggested by the Examiner.

Applicants submit that TOWNSEND fails to disclose or suggest the above features of the present invention. TOWNSEND discloses the transmission to a communicating party of data that is encoded using a randomly selected quantum mechanical operator, as a key for encryption/decryption. The communicating party uses some of the transmitted data as the key for the encryption/decryption (see, for example, column 1, lines 27-50). Accordingly, in TOWNSEND, the key for encrypting/decrypting is transmitted to the communicating party in advance of using a secure channel.

On the other hand, according to the present invention, reference signals are transmitted without transmitting an encryption key itself, utilizing the fact that an estimation value of a propagation environment is determined uniquely by the propagation environment between the communicating party and the communication apparatus, with the encryption key being acquired by estimating the propagation environment using the reference signals.

In the present invention, even if the reference signal is eavesdropped by another party, the position of the another party will be different from the positions of the communicating party and the communication apparatus. Thus, the estimation value of the propagation environment estimated by the another party using the eavesdropped reference signal will be different from the estimation value estimated by the communicating party and the communication apparatus. As a result, only the communicating party and the communication apparatus can perform coding and decoding using a common encryption key, substantially reducing the risk of eavesdropping and ensuring extremely high security.

By the current amendment, Applicants amend independent claims 1 and 9 to clarify the claimed invention, as discussed above. Claim 12 is canceled, and replaced by new claim 13, as is discussed below. As at least the above-discussed features are lacking from TOWNSEND, Applicants submit that the present invention, as defined by the claims, is not anticipated by TOWNSEND. Accordingly, the Examiner is respectfully requested to withdraw the 35 U.S.C. §102(b) rejection, and to indicate the allowability of the pending claims.

Dependent claim 7 stands rejected under 35 U.S.C. §103(a) as being obvious over TOWNSEND in view of U.S. Patent 4,514,753 to SOUTHWORTH et al. Dependent claim 8 stands rejected under 35 U.S.C. §103(a) as being obvious over TOWNSEND in view of U.S. Patent 3,633,105 to LENDER et al. Dependent claim 10 stands rejected under 35 U.S.C. §103(a) as being obvious over TOWNSEND in view of U.S. Patent 3,671,967 to FRIES. Applicants respectfully traverse each 35 U.S.C. §103(a) rejection.

Initially, Applicants note that dependent claim 10 has been canceled, without prejudice, in order to advance the prosecution of the pending application to issue (and not in view of the current rejection to the claim). Thus, Applicants submit that the ground for the rejection of dependent claim 10 no longer exists.

Applicants further submit that SOUTHWORTH et al. and LENDER et al. (and FRIES, which was applied against dependent claim 10) each fail to disclose that which is lacking in TOWNSEND. Thus, Applicants submit that even if one attempted to combine the teaching of TOWNSEND with SOUTHWORTH et al., or the teaching of TOWNSEND with LENDER et al., or the teaching of TOWNSEND with FRIES, in the manners suggested by the Examiner, one would fail to arrive at the presently claimed invention, in which (using claim 1 as an example) a first reference signal generated to enable a communicating party to estimate a propagation environment is transmitted, a first propagation estimation value of the propagation environment is estimated using a second reference signal transmitted from the communicating party, first data being generated using the first propagation estimation value, a transmission signal encoded using a second propagation estimation value that is estimated by the communicating party using the first reference signal being decoded.

In view of the above, Applicants submit that the grounds for the various 35 U.S.C. §103 rejections no longer exist. Accordingly, the Examiner is respectfully requested to withdraw the various 35 U.S.C. §103 rejections, and to indicate the allowability of pending dependent claims 7 and 8.

By the current amendment, Applicants cancel independent claim 12 and submit new independent claim 13 for the Examiner's consideration. New claim 13 is based upon claim 12, but is drafted in light of the above-discussion. Accordingly, a favorable examination of new independent claim 13 is respectfully requested.

Finally, Applicants note that no substantive prior art rejection was set forth against claim 6, claim 6 only being subject to a rejection under 35 U.S.C. §112, second paragraph. Accordingly, Applicants believe that claim 6 contains allowable subject matter, and respectfully requests such an indication by the Examiner in the next official communication. Should the Examiner reject claim 6 in a subsequent Office Action, the Examiner is respectfully requested to make such action non-final, so as to afford Applicants the opportunity to respond to the rejection.

SUMMARY AND CONCLUSION

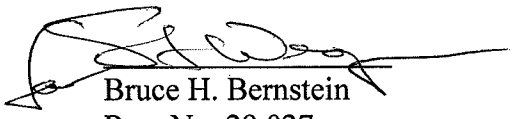
In view of the fact that none of the art of record, whether considered alone or in combination, discloses or suggests the present invention as now defined by the pending claims, and in further view of the above amendments and remarks, reconsideration of the Examiner's action and allowance of the present application are respectfully requested and are believed to be appropriate.

Should the Commissioner determine that an extension of time is required in order to render this response timely and/or complete, a formal request for an extension of time, under

37 C.F.R. §1.136(a), is herewith made in an amount equal to the time period required to render this response timely and/or complete. The Commissioner is authorized to charge any required extension of time fee under 37 C.F.R. §1.17 to Deposit Account No. 19-0089.

If there should be any questions concerning this application, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully Submitted,
Katsuaki ABE et al.



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